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July 29, 2013

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**Subject: Transmission Line Cost Estimates for the Soitec Facility at  
Tierra Del Sol**

Mr. Ellinghaus,

This letter lists the results for several transmission line cost estimates that we performed pursuant to our July 9 proposed scope of work and your July 24 authorization.

**Understanding of the Project and the Use of these Estimates:** Soitec requires engineering cost estimates for the Tierra del Sol project's transmission line located near Boulevard, CA. The project is intended to utilize a 138-kV transmission line, but it is yet to be determined whether the 138-kV line will be overhead, underground, or a combination thereof.

The following estimates are completed without the benefit of design of any type and thus must be considered to be Order-of-Magnitude cost/mile estimates based only on TriAxis experience and judgment. In order to develop per-mile costs, TriAxis has assumed a basic 5-mile-length and divided the cost by 5.

**Order-of-Magnitude Cost Estimates:**

- a. Per-Mile construction cost estimate of a Single-Circuit 138-kV Overhead transmission line using guyed steel poles and designed for a 60-MW solar project: **\$559,000/mile**
- b. Per-Mile construction cost estimate of a 138-kV Underground transmission circuit for a 60-MW solar project: **\$2,000,000/mile**
- c. Discussion of the implications/ concerns with direct-bury method of installing an underground transmission line as compared with installing cables within duct-banks:

Underground transmission cable systems of 69 kV and higher operate with insulation voltage stresses of about two times the voltage stress of cables rated 35-kV and lower. This is done to allow practical cable weights, diameters, cost, and packaging. This cable design standard requires a higher level of insulation purity and special attention to limiting

exposure to water vapor both during manufacture and in operation. Water vapor causes long-term degradation of the insulation.

Because the transmission cable cost is so high, conduit systems are seen throughout the industry as a means to protect the investment. Compared to the direct-bury method, duct banks create a cable environment that is drier and more mechanically protected from accidental dig-ins or vandalism. Conduits also allow the removal and replacement of a faulted cable.

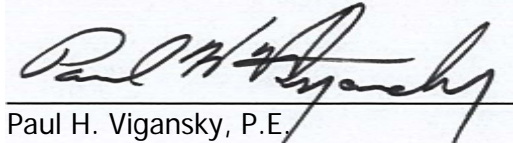
Transmission splices are not as water-vapor-tight as the cables, and are consequently never directly buried. If a direct-buried transmission cable fails for any reason, a new splice vault must be installed at the fault location to repair it.

Where transmission cable must be directly buried, utilities protect the cable with removable sidewalk-size concrete slabs placed 12 inches, or so, below grade and 12 inches above the cables.

If acceptable, I believe that this submittal completes our mutually agreed scope of work. If you require our backup estimate spreadsheets for review, or if you need further discussion, please contact Gordon Ormsby at [gormsby@triaxiseng.com](mailto:gormsby@triaxiseng.com). Gordon is retired, but generally available to assist on this type of project. Also, call me if you have any questions.

Sincerely,

TriAxis Engineering, Inc.

A handwritten signature in black ink, appearing to read "Paul H. Vigansky", is written over a light blue rectangular background.

Paul H. Vigansky, P.E.  
Transmission & Distribution Division Manager